What is claimed is:

1. A method of monitoring fluid condition in situ comprising:

   (a) measuring and recording the temperature T_o of the fluid;

   (b) disposing electrodes in the fluid and exciting one electrode with an alternating current voltage and sweeping the frequency thereof over a certain range.

   (c) measuring the current in a second electrode and computing the reactance (Z") and resistance (Z') at a plurality of predetermined intervals of frequency in the range;

   (d) determining the frequency ($F_{Z" MIN}$) in said range associated with the minimum value of reactance;

   (e) repeating steps a – d for a predetermined number of temperature intervals over a selected range of temperatures and compiling a database of values of $F_{Z"MIN}^{To}$ for each temperature interval in the range;

   (f) measuring the fluid temperature (T_i) and determining $F_{Z"MIN}^{Ti}$ by interpolation from the database;

   (g) exciting one electrode with an alternating current voltage at a frequency less than $F_{Z"MIN}^{Ti}$ and measuring the current in a second electrode and computing the electrode interfacial impedance Z_s and computing the impedance difference ($\Delta Z = Z_S - Z_{NM}$); and,

   (h) determining the fluid condition by interpolation from a database of values of known fluid condition Ψ versus ΔZ.

2. The method defined in claim 1, wherein said step of sweeping the frequency in a certain range includes sweeping the frequency over the range one milliHertz to 10 kHz.

3.   The method defined in claim 1, wherein said step of exciting one electrode includes applying an alternating current voltage in the range of about 0.1 – 2.0 volts.

4.   The method defined in claim 1, wherein said step of measuring the current includes measuring magnitude and phase angle.